



## Mapping Murder

### The Geography of Indian Firearm Fatalities

With a population of almost 1.2 billion people and an area of 3.3 million square kilometres, India is home to approximately 17 per cent of the world's population but constitutes just 2.4 per cent of its land area (MHA, 2011). India's rates of violence vary greatly from state to state, and city to city, ranging from relatively high to negligible. These rates are reflected in the nation's well-known diversity in languages, literacy, economic status, and cultural customs.

This *Issue Brief* analyses the diversity of firearm crime. It focuses on the number of people killed annually by gunfire, which represents the best-documented aspect of the problem. It uses statistical data from the 28 states and seven union territories of India, as well as data from 35 megacities (cities with more than one million residents) for comparisons (see Map 1).

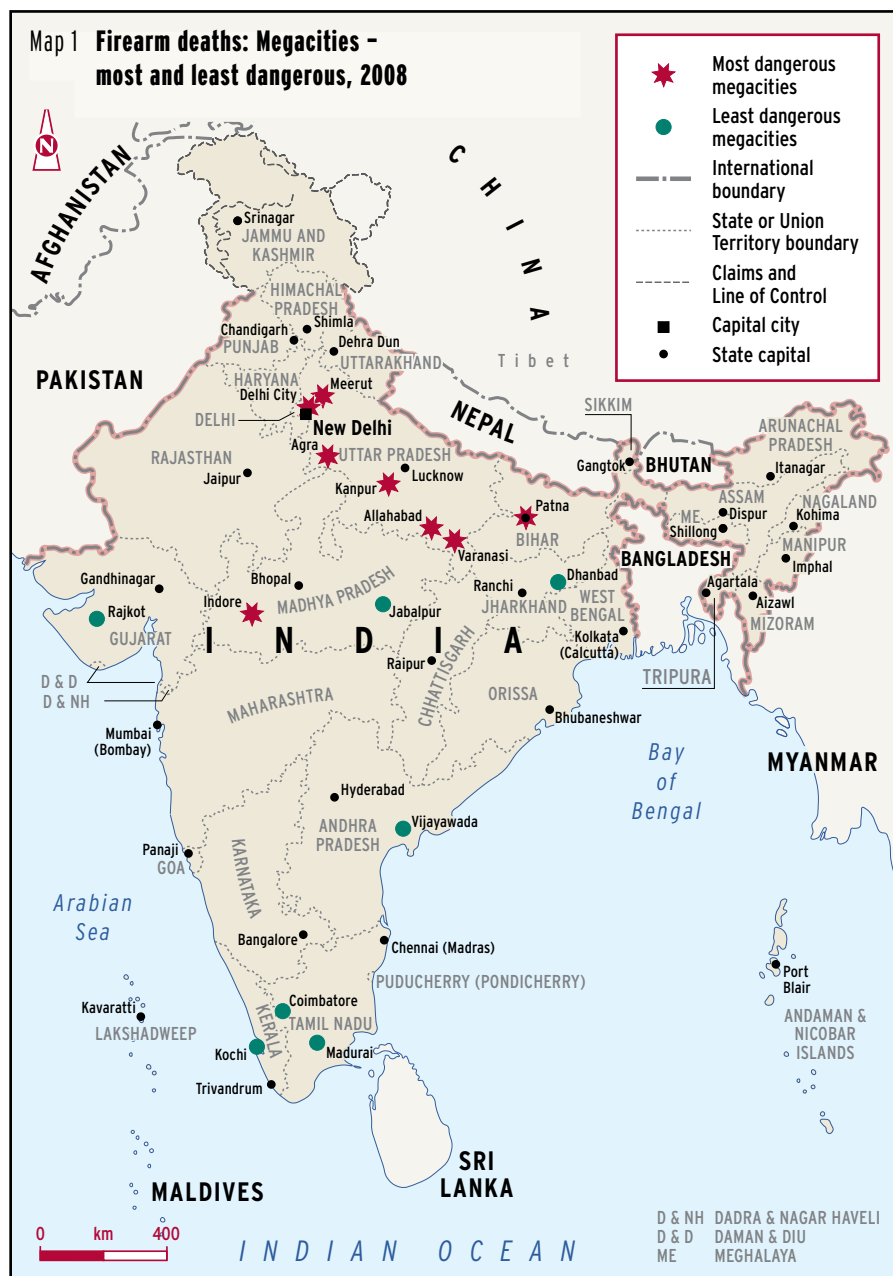
Major findings include the following:

- Roughly 40 million civilian-owned firearms are in India, out of an estimated 650 million civilian guns worldwide. About 6.3 million of the 40 million firearms—just over 15 per cent—are licensed.
- From 1999 to 2008 the total number of reported deaths from firearms, including suicides and accidents, fell by nearly half, from 12,147 in 1999 to 6,219 in 2008.
- Murders by gunfire in India totalled 4,101 in 2008, or 12.2 per cent of all 33,727 murders that year.
- The decline in the rate of murder committed with firearms is especially striking compared to trends in other violent crimes, which declined only slightly during this period.
- Unlicensed firearms account for 86 to 92 per cent of reported firearm-related murders, depending on the year.
- Just three states—Bihar, Jharkhand, and Uttar Pradesh—accounted for almost two-thirds (62.4 per cent) of all victims reportedly murdered by firearms in 2008.
- The nationwide decline in murder and murder by firearm is not uniform, but highly localized. Why some cities witnessed sharp declines whereas others were stable or deteriorated is an important question for further research.
- Autopsy rates vary greatly across cities and regions, as do proportions of autopsies on gunshot victims.
- Autopsy data is consistent with firearm fatality data from the National Crime Records Bureau (NCRB).
- A major source of uncertainty in official data is the category of accidental death from gunfire.



Firearms at a factory on the outskirts of Jammu.

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where low levels of violence suggest that positive lessons may be learned, and on regions where the severity of the problem suggests a need for more effective intervention.

This *Issue Brief* explores the problem of firearm fatalities. In India *murder* is legally distinct from *homicide*, which can include accidental deaths under Indian law. Murder is distinguished as being an intentional act. Thus, for this *Issue Brief*, firearm fatalities are categorized according to Indian practice as accidental deaths, murders, or suicides.

## Firearm fatality scenario for 2008

For 2008, the NCRB reports a total of 4,101 people murdered by firearms in India, or 12.2 per cent of all 33,727 murder victims that year (NCRB, 2009a, p. 195). The total number of reported firearm victims—including suicides and accidental deaths—was 6,219. Murders constituted the largest proportion (66 per cent) of all firearm deaths. Suicides and accidental deaths due to firearms accounted for 34 per cent of the total firearm deaths—a significant proportion (see Table 1). Some criminologists and epidemiologists have raised doubts about NCRB data, making it difficult to regard these figures as conclusive (see Box 1).

In India, most of the victims of firearm murder are killed by unlicensed firearms. According to the NCRB, only 14 per cent of the murder victims in 2008 were killed by licensed firearms (NCRB, 2009a, p. 340; see Table 2). While the precision of this figure is subject to debate, the general proportion seems roughly consistent with media reports. Unlike licensed firearms, unlicensed weapons are generally craft-made and fire single shots; assailants can dispose of them easily and without much loss. They typically cannot be traced to any owner or by ballistic fingerprinting. These features make unlicensed firearms ideal for criminal use.

As at 2006, India was home to roughly 40 million civilian firearms,

Compared to firearm fatality rates in much of the world, India's are not particularly high. In 2008, India officially reported a national firearm murder rate of 0.36 per 100,000 people (NCRB, 2009a, p. 60). Equivalent to roughly one-tenth of the rate of firearm murders in the United States, India's rate is instead comparable to much of Europe's (GunPolicy, n.d.). But Indian national statistics reveal extreme variations across states and cities. While no place in India—even among the most conflict-ridden regions—approaches the levels of violence found in the worst-affected parts of the world, the situation is much worse in some areas than in others.

This assessment relies primarily on statistics from the National Crime Records Bureau (NCRB), the Indian police agency responsible for collecting crime data nationally. While NCRB data is the most widely used crime source for India, its consistency and reliability have been questioned (see Box 1). The incidence of firearm fatalities in the 35 Indian megacities has not been published by the NCRB since 2001; more recent data on these cities was made available to the India Armed Violence Assessment for publication here.

This review does not try to explain the causes of the differences across regions and cities. Instead, this assessment focuses attention on regions

## Box 1 Questions concerning official data

The basic data source on murder and firearm crime in India is the annual report of the National Crime Records Bureau, part of the Ministry of Home Affairs. The NCRB relies on crime reports from state governments; its systematic data is ideal for comparative analysis. But its dependence on crime reports and submissions from state police leads prominent criminologists to question the data's comprehensiveness and reliability. It is usually assumed that reporting of murder is more complete than documentation of other crimes, as it is aided by the presence of a body. Autopsies, emphasized in this *Issue Brief*, appear roughly proportionate to reported murders. Epidemiological study, however, suggests that fatal injuries and suicide both are underreported in India (Eddleston and Konradsen, 2007).

Statistical comparisons with other countries led one analyst to conclude that as little as one-fourth of all crime in India is recorded (Chakraborty, 2003). There is evidence that even violent crime is significantly underreported in India. The low density of police officers in India makes it easier to conceal murders and other firearm crimes. Corruption also appears to be important with respect to suppressing reports (Chakraborty, 2003). It has been argued that Indian police have strong incentives not to report crimes, including the most serious crimes (Verma, 2000). Another problem is misreporting, especially the apparent tendency in some regions for police to report murders and suicides as accidents.

A final source of uncertainty is reporting of death and injury in the context of political violence and insurgent warfare. Whether this type of data consistently makes it into NCRB statistics is obscure. These problems may account for the much higher rates of overall murder and firearm crime recorded in Indian in victimology surveys (Small Arms Survey, 2011).

(Karp, 2011)

out of an estimated 650 million civilian-owned guns then believed to exist worldwide (*Daily Times*, 2006; Small Arms Survey, 2007). Of the 40 million, an estimated 6.3 million are licensed (Hariharan, 2007). These estimates convey a sense of relative scale between legal, illegal, and overall Indian civilian gun ownership. While useful, they are based on limited evidence and should not be treated as conclusive.

Unlicensed weapons are not only

Table 1 Firearm fatalities in India, 2008

Source: NCRB (2009a)

Firearm deaths						Total firearm fatalities	Total murder fatalities	Murders by firearm
Suicide		Murder		Accident				
Number	Percentage of firearm deaths	Number	Percentage of firearm deaths	Number	Percentage of firearm deaths			
479	7.7%	4,101	66.0%	1,639	26.3%	6,219	33,727	12.2%

Table 2 Murders due to licensed and unlicensed firearms, 2008

Source: NCRB (2009a, p. 340)

Total firearm victims	Victims murdered by licensed firearms		Victims murdered by unlicensed firearms	
	Number	Percentage of total firearm victims	Number	Percentage of total firearm victims
4,101	574	14%	3,527	86%

the most common, but also appear to be the most lethal, both overall and individually, although additional research is needed to better substantiate this claim. They are the logical target for more aggressive efforts to reduce firearm-related death and injury. Illegal firearms appear to be most common in the north of India and Naxal-affected regions. The Delhi capital region receives a large quantity of craft-made *kattas*, as they are commonly called, from neighbouring Uttar Pradesh. One source estimates the number of illegal firearms in Delhi at 300,000 (Dikshit, 2009).

## The most and least dangerous regions

The great regional differences in firearm deaths belie any simplistic interpretation of national trends. A mid-year population estimate is used to calculate the number of incidents per 100,000 people in 2008. The estimate yields an average national murder rate of 2.8 murders per 100,000 people annually. Table 3 lists states and union territories with especially high rates of firearms deaths.

Both the murder rate and the firearm fatality rate are much higher in the states and territories in Table 3 than elsewhere (see Table 4).<sup>1</sup> Some of these states have particular characteristics that help to explain their exceptional

gun problems. Although it is far from the only factor at work, in the states of Arunachal Pradesh, Bihar, Jammu and Kashmir, Manipur, Nagaland, Uttar Pradesh, and Uttarakhand, international borders represent a complicating factor that facilitates smuggling. Chhattisgarh and Jharkhand are especially affected by Naxalite–Maoist violence, whereas Jammu and Kashmir, Manipur, and Nagaland are subjected to separatist violence and Bihar experiences especially serious caste-related conflicts.

In 2008 the state of Uttar Pradesh reported the highest incidence of murder cases of all states for the year,

Table 3 The most dangerous states and territories, 2008

Source: NCRB (2009a)

States and territories	Firearm deaths per 100,000 population	Overall murder per 100,000 population
Manipur	6.11	7.1
Nagaland	5.24	6.5
Jharkhand	1.73	5.6
Jammu and Kashmir	1.72	1.9
Uttar Pradesh	1.47	2.4
Uttarakhand	1.11	2.3
Arunachal Pradesh	0.91	6.0
Bihar	0.70	3.3
Chhattisgarh	0.70	4.9
Delhi	0.68	3.2

Note: Data for firearm deaths per 100,000 population is rounded to two significant digits.





A injured man is carried into hospital after protests in Srinigar in which three people were shot and killed, August 2010.

© AP Photo / Dar Yasin

with 4,564 reported from all causes, accounting for almost 14 per cent of total cases in the country. This one state represented just under 36 per cent of the victims murdered with firearms nationally. Bihar accounted for 3,139 cases, or 9.6 per cent of the total murder cases in the country. Uttar Pradesh, Bihar, and Jharkhand together accounted for 62.4 per cent of all victims killed by firearms in 2008. This rate was undoubtedly affected by the easy availability of illegal firearms in these states, yet it also reflects political violence, caste conflicts, and Naxalite attacks, in all of which the use of firearms is common.

In contrast, the states and union territories listed in Table 4 rank among the lowest in terms of firearm death rates in India. With a few exceptions, states with lower-than-average murder rates also had lower firearm fatality rates. Factors contributing to the high

rate of firearm fatalities in some states mentioned above do not appear to play a comparable role in these low-violence states. The glaring exceptions are

**Table 4 The least dangerous states and territories, 2008**

State	Firearm deaths per 100,000 population	Overall murder per 100,000 population
Lakshadweep	0.00	1.4
Sikkim	0.00	1.5
Andaman and Nicobar Islands	0.00	1.9
Puducherry	0.00	3.2
Dadar and Nagar Haveli	0.00	3.4
Kerala	0.003	1.1
Orissa	0.02	3.1
Gujarat	0.04	2.0
Tamil Nadu	0.04	2.6
Andhra Pradesh	0.06	3.3

Note: Data for firearm deaths per 100,000 population is rounded to two significant digits, with the exception of Kerala. Source: NCRB (2009a)

Andhra Pradesh and Orissa (both with high murder rates), which combine low firearm murder rates overall with intense levels of Naxal warfare in many districts. It may be that limited small arms availability in these states helps to contain rates that otherwise could be much higher.

Gun availability may not be the whole story. Kerala, Puducherry, and Tamil Nadu have low firearm fatality rates despite the close proximity of Sri Lanka and the weapons trade from southern India, which is suspected of having fed the island rebellion until its defeat in 2009. Other factors appear to be influencing firearm fatality rates in south India and thus need to be investigated in detail.

Rates of accidental firearm deaths rival those of intentional gun deaths in some states, especially in states with illegal firearm problems. High rates may partly capture inexperienced

owners testing illegal weapons, but exceptional levels of accidental gun deaths suggest that other phenomena—such as questionable reporting by the police—are at work. In Arunachal

Pradesh and Uttar Pradesh, most notably, accidental deaths accounted for 36.4 per cent and 42.3 per cent of all firearm fatalities, respectively. Although the evidence is largely cir-

cumstantial, it appears that murders and suicides are being reported as accidental deaths.

Table 5 Firearm fatalities in India, 2008

State	Firearm deaths				Est. 2008 population (millions)	Firearm fatality rate per 100,000 population
	Murders	Suicides	Accidents	Total		
Andhra Pradesh	11	27	12	50	82.0	0.06
Arunachal Pradesh	5	2	4	11	1.2	0.91
Assam	30	6	16	52	30.0	0.17
Bihar	622	7	35	664	94.0	0.70
Chhattisgarh	104	5	58	167	24.0	0.70
Goa	2	3	0	5	1.6	0.30
Gujarat	14	5	3	22	57.0	0.04
Haryana	116	11	25	152	24.0	0.64
Himachal Pradesh	3	7	3	13	6.6	0.20
Jammu & Kashmir	181	8	26	215	13.0	1.72
Jharkhand	467	53	1	521	30.0	1.73
Karnataka	11	38	7	56	58.0	0.10
Kerala	0	0	1	1	34.0	0.003
Madhya Pradesh	197	27	81	305	70.0	0.44
Maharashtra	197	6	6	209	107.0	0.19
Manipur	154	4	3	161	2.6	6.11
Meghalaya	8	2	3	13	2.5	0.51
Mizoram	2	2	1	5	1.0	0.51
Nagaland	92	5	18	115	2.0	5.24
Orissa	3	2	3	8	40.0	0.02
Punjab	54	16	38	108	27.0	0.41
Rajasthan	77	12	3	92	65.0	0.14
Sikkim	0	0	0	0	0.6	0.00
Tamil Nadu	2	22	0	24	67.0	0.04
Tripura	9	2	1	12	3.5	0.34
Uttar Pradesh	1,470	162	1,197	2,829	192.0	1.47
Uttarakhand	86	3	17	106	9.5	1.11
West Bengal	111	28	40	179	88.0	0.20
Union territory						
Andaman and Nicobar Islands	0	0	0	0	0.4	0.00
Chandigarh	0	4	2	6	1.0	0.56
Dadar and Nagar Haveli	0	0	0	0	0.2	0.00
Daman and Diu	0	1	0	1	0.2	0.53
Delhi (capital territory)	73	9	35	117	17.0	0.68
Lakshadweep	0	0	0	0	0.07	0.00
Puducherry	0	0	0	0	1.0	0.00
<b>Total</b>	<b>4,101</b>	<b>479</b>	<b>1,639</b>	<b>6,219</b>		

Table 6 Firearm fatalities in 35 megacities of India, 2008

City	Firearm deaths				Est. 2008 population (millions)	Firearm fatality rate per 100,000 population
	Murders	Suicides	Accidents	Total		
Agra	11	1	2	14	1.3	1.10
Ahmedabad	1	0	0	1	4.5	0.02
Allahabad	12	8	43	63	1.0	6.00
Amritsar	2	2	2	6	1.0	0.59
Asansol	0	0	4	4	1.1	0.37
Bengaluru	0	5	0	5	5.7	0.09
Bhopal	2	1	0	3	1.5	0.21
Chennai	0	0	2	2	6.4	0.06
Coimbatore	0	0	0	0	1.4	0.00
Delhi City	58	8	31	97	12.8	0.76
Dhanbad	0	0	0	0	1.1	0.00
Faridabad	4	1	0	5	1.1	0.47
Hyderabad	0	5	8	13	5.5	0.23
Indore	14	0	0	14	1.6	0.85
Jabalpur	0	0	0	0	1.1	0.00
Jaipur	4	3	0	7	2.3	0.30
Jamshedpur	0	0	0	0	1.1	0.00
Kanpur	35	2	19	56	2.7	2.10
Kochi	0	0	0	0	1.4	0.00
Kolkata	2	0	0	2	13.2	0.02
Lucknow	14	0	1	15	2.3	0.66
Ludhiana	5	2	2	9	1.4	0.65
Madurai	0	0	0	0	1.2	0.00
Meerut	7	13	243	263	1.2	23.00
Mumbai	110	0	0	110	1.6	0.67
Nagpur	3	1	0	4	2.1	0.19
Nasik	0	0	0	0	1.2	0.00
Patna	46	4	4	54	1.7	3.20
Pune	3	0	0	3	3.8	0.08
Rajkot	0	0	0	0	1.0	0.00
Surat	0	1	0	1	2.8	0.00
Vadodara	1	0	0	1	1.5	0.07
Varanasi	11	4	23	38	1.2	3.10
Vijayawada	0	0	0	0	1.0	0.00
Vishakhapatnam	0	1	0	1	1.3	0.08
<b>Total</b>	<b>345</b>	<b>62</b>	<b>384</b>	<b>791</b>		

Note: Firearm fatality rates are rounded to two significant digits.

Sources for Tables 5 and 6: NCRB (2009a; 2009b); author communication with the NCRB

## The most and least dangerous megacities

Table 6 shows the distribution of firearm fatalities in 35 megacities of India. The average annual murder rate for Indian megacities in 2008 was 2.7 for every 100,000 people. Generally, cities with higher murder rates also had higher firearm fatality rates.

Table 6 can be read as a list of the least dangerous and most dangerous major cities of the country. Among those with the highest rates of firearm deaths are the megacities in Table 7, ranked by firearm deaths per 100,000 residents.

Among the safest megacities of India—those with the lowest rates of firearm fatalities in 2008—are several where no gun murders were reported that year. They are listed in Table 8 by their firearm death rate per 100,000 residents.

The factors that affect the firearm fatality rates in the states appear to have a similar influence on the cities. But there also are important idiosyncrasies. Most cities in the state of Uttar Pradesh, including Allahabad, Kanpur, Meerut, and Varanasi, had a high percentage of firearm fatalities due to accidents and a very low percentage of firearm fatalities due to murders (see Table 9).

Table 7 The most dangerous megacities, 2008

City	Firearm deaths per 100,000 population	Overall murder per 100,000 population
Meerut	23.0	4.6
Allahabad	6.0	4.4
Patna	3.2	8.6
Varanasi	3.1	3.4
Kanpur	2.1	6.2
Agra	1.1	3.9
Indore	0.9	5.9
Delhi City	0.8	3.5

Note: Data is rounded to two significant digits.  
Sources: NCRB (2009a); author communication with the NCRB.

Table 8 The least dangerous megacities, 2008

City	Firearm deaths per 100,000 population	Overall murder per 100,000 population
Kochi	0	0.7
Coimbatore	0	1.4
Dhanbad	0	2.4
Jabalpur	0	3.0
Madurai	0	3.3
Vijayawada	0	3.4
Rajkot	0	3.6
Nasik	0	3.7
Jamshedpur	0	3.9
Ahmedabad	0.02	1.9
Kolkata	0.02	0.4

Note: The overall murder rate is rounded to two significant digits.  
Sources: NCRB (2009a); author communication with the NCRB.

Meerut was the extreme case, with just 2.6 per cent of the total firearm deaths in the city reportedly due to murders by firearm, and 92 per cent reportedly due to accidental causes. This is strange, because Meerut has a high murder rate—4.6 per 100,000—compared with the average megacity murder rate of 2.7 per 100,000 and the national average murder rate of 2.8. Meerut has a large number of illegal firearm factories, some of which may be causing accidental firearm deaths. But this cannot be the only reason for the high rate of firearm deaths. This pattern is also seen in some other cities of Uttar Pradesh, but not at such a significant level in any other state.

Rigorous examination of gun deaths in Meerut and other megacities of Uttar Pradesh is urgently needed. Could it be that some murders and suicides are being reported as accidental deaths, as mentioned earlier? Or are they being reported as deaths due to rash and negligent acts?

## Trends in firearm fatalities, 1999–2008

The NCRB started reporting information on the use of firearms in murders from the states and union territories in 1999. The number of victims murdered by firearms has nearly halved since 1999 (see Table 10). A total of 9,294 victims were killed by firearms in 1999, and this number declined in the following years, with 4,101 victims being killed by firearms in 2008. The proportion of murder victims killed by firearms has declined from 24.3 per cent in 1999 to 14 per cent in 2008, leading to the conclusion that murders due to firearms have unquestionably decreased during the past ten years. As noted above, however, some criminologists and epidemiologists have raised doubts about the NCRB data (see Box 1).

As revealed in Table 10, the absolute number of victims being murdered by all types of gun—licensed and unlicensed—declined during the period 1999–2008. As the total number of shooting deaths fell, so did the proportion of deaths caused by unlicensed



Seized weapons from illegal arms factories in Nalanda, near Patna, Bihar

© AFP PHOTO / Deshakalyan CHOWDHURY



guns, although the drop is not enormous. Victims murdered by unlicensed firearms constituted 92 per cent of all firearm murder victims in 1999, but this figure had fallen to 86 per cent by 2008. This drop might suggest some degree of success of official efforts to curb unlicensed firearms. The magnitude of the problem posed by unlicensed firearms remains alarming, however.

During the same ten-year period, the total reported firearm deaths fell by nearly half, from 12,147 deaths in 1999 to 6,219 deaths in 2008 (see Table 11). Reports of all forms of violent crime, by contrast, went down only slightly, from 238,081 in 1999 to 228,663 in 2008 (NCRB, 2005, p. 169; 2009a, p. 51). The dramatic decline in firearm deaths is a major achievement, although its causes remain largely unknown. Identifying the forces behind this drop is among the most important tasks facing contemporary Indian criminology. Possibilities include economic development, police reform, and social activism. But these are guesses; the Indian murder rate drop remains enigmatic.

Not only is the murder rate down, but the proportion of murders due to firearms is down even more. The share of firearm deaths due to murder—as opposed to suicides and accidents—declined from just under 77 per cent in 1999 to 66 per cent in 2008. The share of suicides by firearms, however, increased from 19 to 26 per cent during the same period. The share of accidental deaths due to firearms increased even more rapidly, from 4.5 per cent in 1999 to almost 8 per cent in 2008. Thus, while there was a decline in the share of murders by firearm over this ten-year period, and the past five years especially, the annual proportions of suicides and accidental deaths have increased during this period. The decline in the number of murders by firearm should also be viewed in light of the fact that there has been a decline in the number of murders in this period.

Firearm fatalities in selected Indian megacities were tabulated over a ten-year period to see whether patterns would emerge. Figure 1 shows the number of people killed by firearms in cities with especially high firearm

Table 9 Firearm murders and accidental deaths in selected cities, 2008

City	Firearm murders		Accidental firearm deaths		Total firearm deaths
	Number	Percentage of all firearm deaths	Number	Percentage of all firearm deaths	
Agra	11	79	2	14	14
Allahabad	12	19	43	68	63
Delhi City	58	60	31	32	97
Indore	14	100	0	0	14
Kanpur	35	63	19	34	56
Meerut	7	3	243	92	263
Patna	46	85	4	12	54
Varanasi	11	29	23	61	38

Sources: NCRB (2009a); author communication with the NCRB

Table 10 Murders in India due to licensed and unlicensed firearms, 1999–2008

Year	All murders	Killed by licensed firearms		Killed by unlicensed firearms		Total firearm murder victims
	Victims	Victims	Percentage of total firearm murders	Victims	Percentage of total firearm murders	
1999	38,272	772	8	8,522	92	9,294
2000	40,373	589	7	7,781	93	8,370
2001	38,636	591	7	7,428	93	8,019
2002	38,033	837	9	8,456	91	9,293
2003	33,821	624	8	7,202	92	7,826
2004	34,915	813	10	7,621	90	8,434
2005	34,419	556	10	5,087	90	5,643
2006	33,808	587	11	4,988	89	5,575
2007	33,428	598	12	4,240	88	4,838
2008	33,727	574	14	3,527	86	4,101

Sources: NCRB (2009a; n.d.a); author communication with the NCRB

Table 11 Firearm deaths in India, 1999–2008

Year	Murders		Suicides		Accidents		Total firearm deaths
	Number	Percentage of total firearm deaths	Number	Percentage of total firearm deaths	Number	Percentage of total firearm deaths	
1999	9,294	77	2,303	19	550	4.5	12,147
2000	8,370	73	2,634	23	515	4.4	11,519
2001	8,019	72	2,688	24	395	3.6	11,102
2002	9,293	75	2,597	21	471	3.8	12,361
2003	7,826	76	1,993	19	544	5.3	10,363
2004	8,434	75	2,283	20	503	4.5	11,220
2005	5,643	65	2,254	27	752	8.9	8,469
2006	5,575	69	2,161	27	353	4.4	8,089
2007	4,838	64	2,046	27	719	9.5	7,603
2008	4,101	66	1,639	26	479	7.7	6,219

Note: owing to rounding, percentages may not add up to 100.

Sources: NCRB (2009a; 2009b; n.d.a; n.d.b)

fatality rates. The examples here reveal radically different trajectories. While some cities' rates seem relatively stable, others—such as those of Agra, Kanpur, and Patna—saw major declines after the year 2000, although the numbers are still high when compared to those of other cities. A lack of data makes complete comparison of all cities—even just megacities—impossible. The available data does show that the nationwide decline in murder and firearms murder is not a uniform phenomenon, but a highly localized one. Why some cities witnessed sharp declines while others were stable or even saw an increase in the murder rate is an important question for further research.

Even where fatality rates are relatively low, great volatility from year to year seems to be normal. Figure 2 shows the number of victims killed by firearms in cities with low firearm fatality rates. All the cities continued to have low firearm fatality rates during the past ten years, but some display remarkable variability, often with a single year standing out dramatically. Examples include Chennai in 2005, Jamshedpur in 2007, Madurai before 2003, and Rajkot and Vijaywada in 2003. Kolkata and Surat saw consistent decreases during the same period.

## Confirming evidence: autopsies of fatal firearm injuries

Post-mortem examination, or autopsy, is a procedure performed by medical doctors to determine the cause and manner of death. In India two types of autopsy are performed: pathological and medico-legal or forensic.<sup>2</sup>

Pathological autopsies are performed if a fatal disease process or the cause of death could not be ascertained prior to loss of life. They aim to determine the cause of death to deepen medical knowledge and to provide information to the relatives of the deceased. This type of autopsy requires the consent of the relatives of the deceased.

Forensic autopsies are legally required in all cases of suspicious, unnatural, or sudden death, where there are chances that foul play has caused the death, or a law of the land has been violated during the death process. Hence all accidental, suicidal, and homicidal deaths are supposed to undergo autopsy in India. Since such autopsies are required by law, the consent of relatives is not necessary. Forensic autopsies are thus performed in all cases of unnatural death that are reported to the authorities.

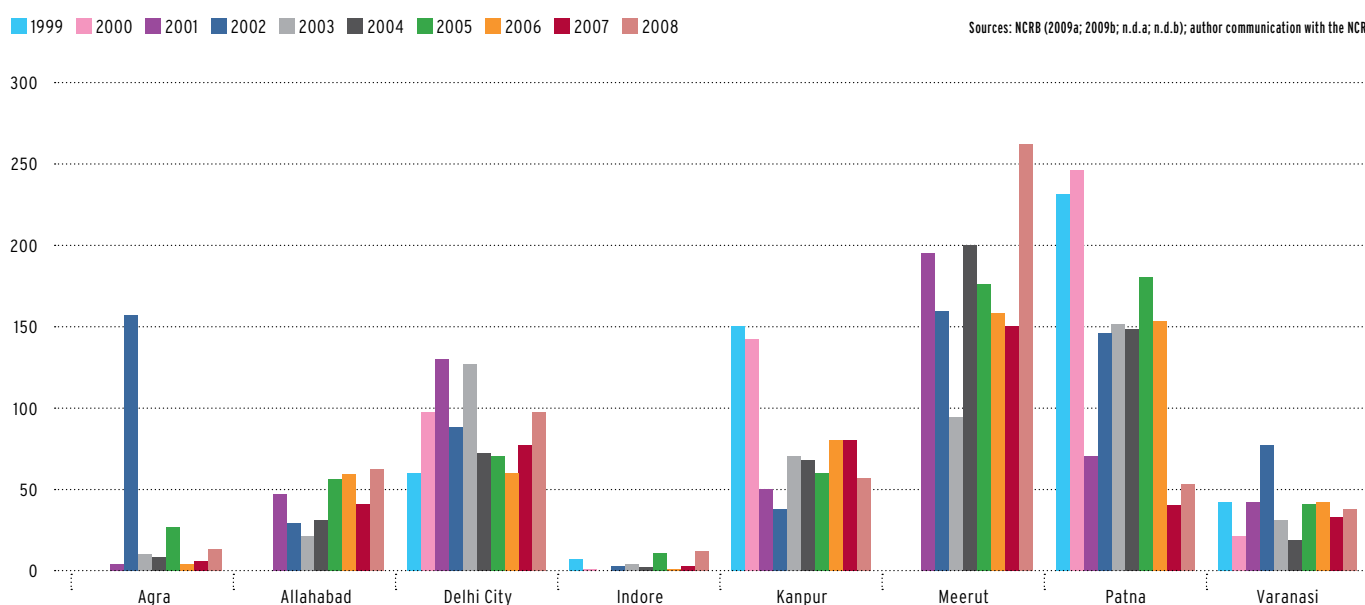
The only deaths from unnatural causes that avoid an autopsy are those not reported to the police or

health authorities and those involving a body that is concealed from discovery. While such cases may arise with respect to some deaths, especially in remote areas, there is no evidence that they are frequent. Autopsies may also be circumvented if death certificates identify suicides as deaths attributable to natural or accidental causes; such misrepresentation is mainly designed to avoid the social stigma and legal consequences associated with suicide.

Autopsies are performed all over India, in various medical centres authorized by the government. The police deliver a written request to perform an autopsy to qualified doctors, who work independently of the police at these authorized centres; upon performing an autopsy, a doctor submits a report to the police. The data obtained from these procedures generally seems accurate and consistent, despite of normal problems of categorization. As autopsy centres cater to specific regions, their data provides good insight into mortality patterns in those particular areas.

Further insight is provided by published research on murder patterns in Indian cities. Most studies compare all forms of murder, helping to place firearm use in an overall context.<sup>3</sup> A few consider only firearm murders, thus excluding murders by other means.<sup>4</sup> Two particularly instructive studies focus on the cities of Imphal and Surat, which were examined during different

Figure 1 Number of firearm victims in selected cities with high firearm fatality rates, 1999–2008



Sources: NCRB (2009a; 2009b; n.d.a; n.d.b); author communication with the NCRB



time periods. Since such studies are undertaken by academic specialists in forensic medicine, their great strength is methodological consistency and, consequently, comparability. Their weakness is their unsystematic coverage—they are limited to a handful of cities. In cases of large cities with more than one medical college or autopsy centre, study data may not cover the entire city. Yet the data produced by these studies can provide insight into firearm-injury patterns in these cities and their states—independently of the NCRB data.

An indication of the lack of national policy regarding autopsies is the variation in the number and proportion of autopsies performed at the dedicated centres in these cities. Autopsy rates seem to vary greatly across cities and regions, as do proportions of autopsies involving firearm deaths. The reasons for these variations are not well understood. This review finds that Imphal, the capital of Manipur, exhibits the highest rate of autopsies on gunshot victims; 42.5 per cent of all autopsies were carried out on murder victims, while a lower—yet still impressive—proportion involved firearm murder victims. It may be relevant that Manipur is home to the highest firearm murder rate in the country (see Figures 3 and 4). Whereas Imphal stands out based on its uniquely high recourse to autopsy for victims of firearm murders, a large



The body of a victim of armed violence lies at a mortuary in Hyderabad

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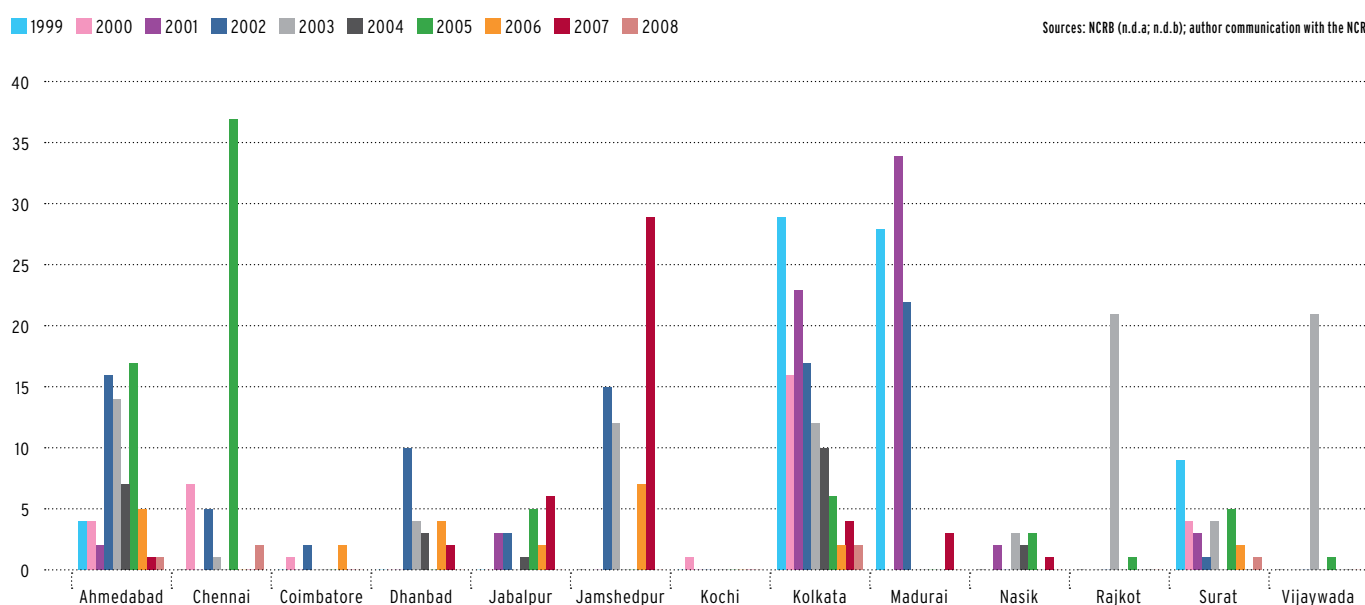
percentage of murders in Guwahati in Assam were due to firearms. In both cases, investigation of deaths associated with insurgency and counterinsurgency may be at work. It would appear that other contexts of firearm death, such as crime and domestic violence, command less official attention.

Autopsy data also reveals great variation in the cause of death. Blunt-force injuries—such as from beating with hands, feet, or objects—were the most common fatal injuries in Amritsar, Rohtak, and Surat. Injuries from sharp weapons were the dominant fatal injuries in Amritsar, Manipal, Nagpur,

and Surat. Firearm injuries were the dominant fatal injuries in Allahabad, Imphal, and Varanasi (see Table 12).

A study of firearm fatalities in Delhi finds 107 firearm fatalities among a total of 7,034 autopsies performed—or 1.5 per cent of all autopsies (Kohli and Aggarwal, 2006). Men accounted for the vast majority (91 per cent) of the victims. Of the 107 victims, 88 died of bullet wounds, while 19 died of pellet injuries. Of the total firearm fatalities examined, murders constitute 92.6 per cent, suicides 6.5 per cent, and accidental deaths just under 1 per cent. It may be relevant that Delhi lies only 60 kilo-

Figure 2 Number of firearm victims in selected cities with low firearm fatality rates, 1999–2008



Sources: NCRB (n.d.a; n.d.b); author communication with the NCRB

metres from Meerut, where the firearm fatality rate is exceptionally high and unlicensed craft weapons are being produced.

One study reviews 18 years of autopsies in Imphal, in a region afflicted by separatist warfare (Pradipkumar et al., 2005). It reveals that out of 3,947 cases of death due to firearm injuries, 1,248 (almost 32 per cent) were submitted for autopsy. Of these autopsied cases, 36 per cent were reportedly killed by militants, 32 per cent by security forces, and 32 per cent by unknown assailants. Nearly all of these victims (98 per cent) were men; 54 per cent were

civilians. Of the civilians, 28 per cent were killed by unknown assailants, 21 per cent were reportedly killed by insurgents, and 4 per cent by security forces. The majority of the victims (60 per cent) suffered firearm injuries to the head.

Longitudinal reviews of autopsy trends are lacking, but repeated examinations of data from Delhi are suggestive of patterns over time. For Delhi, in 1991–93, firearm murders constituted 14 out of 134 murders submitted to autopsy. Ten cases involved bullet injuries, while the remaining four had shotgun pellet injuries (Kohli and

Aggarwal, 1996, pp. 36–7). A follow-up study, conducted in the same part of Delhi in 2006–07, finds that 44 firearm murders out of 183 murders (24 per cent) were submitted for autopsy. Of these deaths, 43 were due to bullets and one to pellet injuries (Kohli and Kumar, 2009, pp. 129–34). A comparison shows a significant increase in the percentage of firearm murders as a proportion of all autopsies over the 15-year period, with a rise from 10 to 24 per cent.

These Delhi autopsy studies offer an independent check on NCRB reports of firearm murders. While the data developed so far does not permit rigorous correlation between NCRB crime reports and autopsy data, the two sources generally appear to correspond. This apparent correspondence—an important area for future research—supports the credibility of the NCRB figures regarding reported murder.

## Conclusions

Readers of this review should be in no doubt that researchers are only beginning to understand the role of guns in Indian society. Previous research—much by forensic pathologists—leaves no doubt about the importance of the problem. The fatality statistics examined here show that murders constitute the vast majority of firearm deaths in India; suicides by firearms are much less common. Significant regional variation in firearm fatalities is another striking aspect of the geography of Indian gunfire deaths; the rates vary across states and cities, ranging from negligible firearm fatalities to much higher levels of killings.

The trends revealed here point to a broad agenda for future research. Three areas that seem especially urgent are *positive lessons*, control over the *illegal gun trade*, and the meaning of reported *accidental death*. There are many positive lessons to be learned from the Indian experience. Most important of all is the decline in the total number of firearm deaths since 1999. There has also been a decline in the number of murder victims killed specifically by firearms. The factors behind this decline remain poorly understood. The low firearm

Figure 3 Percentage of murder cases submitted for autopsy

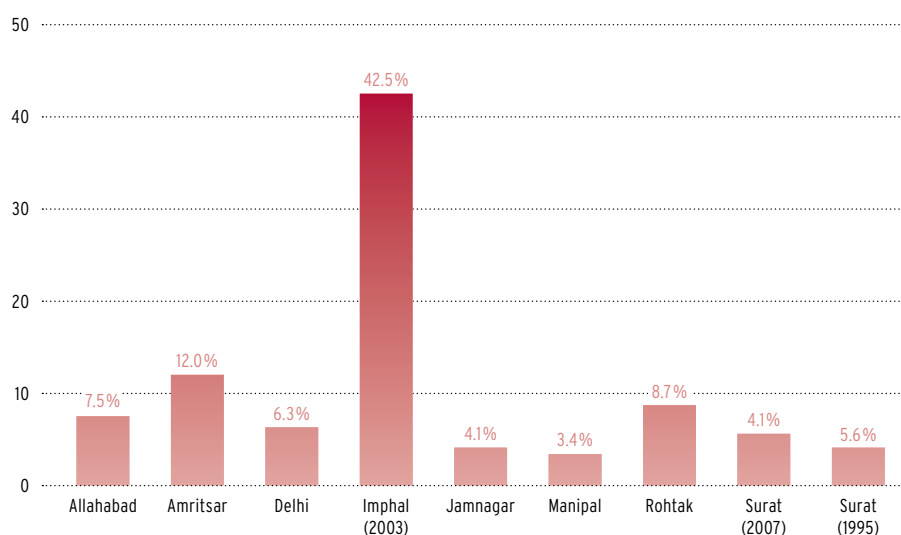
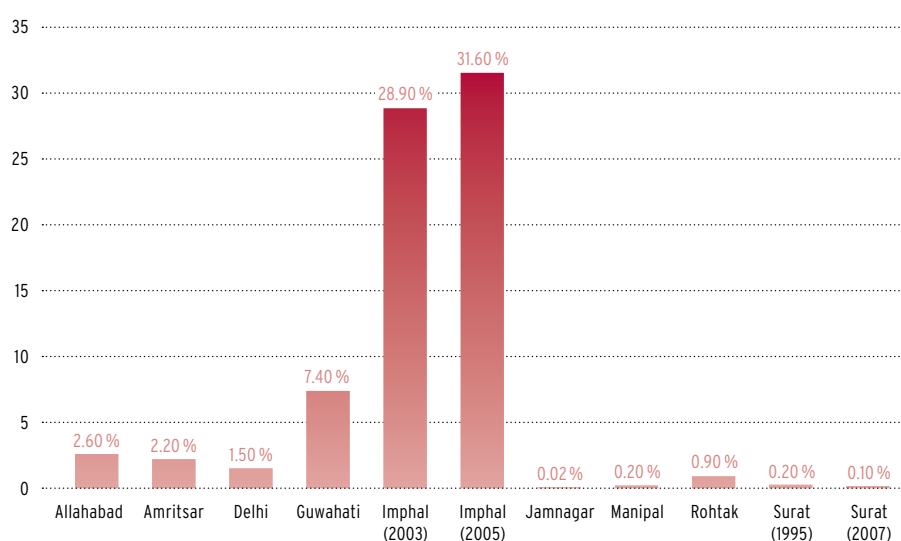


Figure 4 Percentage of firearm murders submitted for autopsy



Sources for Figures 3 and 4: Allahabad: Sinha, Kapoor, and Pandey (2003, pp. 33–35); Amritsar: Mittal et al. (2005, pp. 226–27); Delhi: Kohli and Kumar (2009, pp. 129, 134); Guwahati: Patowary (2007, pp. 92–93); Imphal: Memchoubi, Momonchand, and Fimate (2003, pp. 13–14); Pradipkumar et al. (2005, p. 223); Jamnagar: Gupta and Singh (2007, pp. 6–7); Manipal: Mohanty et al. (2005, pp. 302–03); Rohtak: Pal, Paliwal, and Yadav (1994, pp. 42–43); Surat: Sheikh and Subramanyam (1995, pp. 9–13); Gupta, Prajapati, and Kumar (2007, pp. 29–31)

fatality rates in the southern states of Kerala, Puducherry, and Tamil Nadu and cities elsewhere—such as Kolkata—are especially puzzling and require investigation to benefit policy-making. Are firearms less readily available in India's low-gun-death regions, or is the importance of gun availability exaggerated?

The lethality of illicit guns in India today seems clear enough, but the forces at work are anything but obvious. Would legalization, for example, reduce the dangers, or increase them? At a minimum, deaths caused by unlicensed firearms need further analysis. What proportion of illegal guns were smuggled across borders, and what proportion are Indian craft-made *kattas*? Do smuggled guns kill more people than craft guns? Based on the author's own Delhi-region autopsy research, it seems that most deadly firearm crimes involve domestically made craft guns, not imported ones. Smuggled weapons are much more significant where armed conflict and terrorism are dominant. Yet these observations need verification.

A worrying feature to emerge from this review is the high—possibly extreme—rate of accidental firearm fatality in some Indian cities. Accidental firearm deaths, especially in the state of Uttar Pradesh, are a major source of statistical uncertainty and overall doubt. Has there been misinterpretation of data regarding the cause of death, and how are types of death established? Were there witnesses, for example? What proportion of these deaths involves licensed versus unlicensed guns? Did the fatalities occur at the place of manufacture during testing, or in public places during wedding celebrations or similar events, where ceremonial firing often takes place? The data on accidental firearm deaths raises more questions than answers and weakens the credibility of apparent trends. ■

Table 12 **Murder weapons and causes of murder in selected Indian cities, as percentage of total**

Cities	Blunt	Sharp	Blunt and sharp	Firearm	Asphyxia	Poisoning	Burns	Other
Allahabad	24	19	0	35	14	2	2.5	4.5
Amritsar	51	32	0	13	0	0	0	4
Delhi	29	29	0	24	14	0.5	4.5	0
Imphal	13	12	0	68	2.5	0	0.5	4
Jamnagar	27	21	13	0.5	21	1.5	13	3
Manipal	30	38	7	5	5	0	16	0
Nagpur	22	54	4	2	6	0.5	12	0.5
Rohtak	48	25	0	11	9	3	5	0
Surat (1995)	38	48	0	5	7	0	2	0
Surat (2007)	43	34	7	3	5	0.5	6	2
Varanasi	14	10	0	42	9	1.6	12	12

Note: owing to rounding, city totals may not add up to 100 per cent.

Sources: See the sources for Figures 3 and 4; Varanasi: Upadhyay and Tripathi (2004)

## Notes

*This Issue Brief was written by Dr. Anil Kohli, Department of Forensic Medicine, University College of Medical Sciences, Delhi, and edited by Aaron Karp. Sonal Marwah updated data and prepared the tables.*

- 1 In November 2000 the states of Chhattisgarh, Jharkhand, and Uttarakhand were carved out of the states of Madhya Pradesh, Bihar, and Uttar Pradesh, respectively. Until 2007, the newly formed state of Uttarakhand had the interim name of Uttaranchal. The crime patterns of these states do not differ significantly from those of the states from which they were extracted.
- 2 In contrast, a verbal autopsy is a systematic retrospective inquiry of family members about the circumstances, events, symptoms, and signs of illness and treatment to determine the underlying cause of death.
- 3 These studies cover **Allahabad** (Sinha, Kapoor, and Pandey, 2003, pp. 33–35), **Amritsar** (Mittal et al., 2005, pp. 226–27), **Delhi** (Kohli and Kumar, 2009, pp. 129, 134), **Imphal** (Memchoubi, Momonchand, and Fimate, 2003, pp. 13–14), **Jamnagar** (Gupta and Singh, 2007, pp. 6–7), **Manipal** (Mohanty et al., 2005, pp. 302–03), **Nagpur** (Ghangale, Dhawane, and Mukherjee, 2003, p. 48), **Rohtak** (Pal, Paliwal, and Yadav, 1994, pp. 42–43), **Surat** (Sheikh and Subramanyam, 1995, pp. 9–13; Gupta, Prajapati, and Kumar, 2007, pp. 29–31), and **Varanasi** (Upadhyay and Tripathi, 2004).
- 4 These studies cover **Delhi** (Kohli and Aggarwal, 1996, pp. 264–65), **Guwahati** (Patowary, 2007, pp. 92–93), and **Imphal** (Pradipkumar et al., 2005, p. 223).

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## About the India Armed Violence Assessment

The India Armed Violence Assessment (IAVA) promotes research and supports India's social science communities dedicated to studying the causes and consequences of armed violence. Developed in coordination with Indian partners, the IAVA explores wide-ranging issues related to the instruments, actors, and enabling institutions that shape security. It intends to catalyse evidence-based debate in India and facilitate Indian contributions to global policy and programming on related issues. The project is supported by the Small Arms Survey.

IAVA *Issue Briefs* review the state of knowledge on key themes associated with armed violence. Commissioned by the Small Arms Survey, *Issue Briefs* summarize major findings and insights into issues related to conflict and crime-related violence, perpetrators and victims, prevention and reduction, and strategies to contain violence. They stress data-based research findings on the scale, forms, and severity of armed conflict, contributing forces, and the impact of policy responses.

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